

Notice of Allowability

Application No.

10/776,464

Applicant(s)

BRAKELMANN ET AL

Examiner

Erica E. Cadugan

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to dk1 56/426, filed 2/10/04 and interview of 1/18/06.
2. ☒ The allowed claim(s) is/are 1-13.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>5/7/04</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John Freeman on January 18, 2006.

The application has been amended as follows:

Claim 1 (Currently Amended). A method for the orientation of a spindle of a numerically controlled and rapidly rotating spindle by which said spindle is brought from an initial rotational speed into a predetermined position of rest, the method comprising:

performing a first phase of orientation of said spindle by braking said spindle at a first braking rate function to a threshold rotational speed, wherein during said braking a switching over from a speed controller to a position controller is prepared, said switching over is performed at a switching time during a transition from said first phase of orientation to a second phase of orientation, said switching over is continuous in regard to position and/or rotational speed, and wherein a rotational speed of said spindle drops strictly monotonically during said switching over; and

performing said second phase of orientation of said spindle so that a predetermined position of rest for said spindle is controlled by said position controller from said switching time until said predetermined position of rest of said spindle has been reached in said second phase at

a position time, said second phase of orientation having a second braking rate function different than said first braking rate function.

Claim 2 (Currently Amended). The method for spindle orientation in accordance with claim 1, wherein said braking at said first braking rate function is performed with a maximally possible current of an electronic drive unit that drives said spindle.

Claim 5 (Currently Amended). The method for spindle orientation in accordance with claim 3, wherein said monitoring unit monitors a temperature of [an] said electronic drive unit and limits a current of said electronic drive unit when overheating is threatened.

Claim 6 (Currently Amended). The method for spindle orientation in accordance with claim 1, wherein said braking at said first braking rate function is performed by presetting a small nominal rotational speed clearly below said threshold rotational speed [is preset] in [a rotational] said speed controller.

Claim 8 (Currently Amended). The method for spindle orientation in accordance with claim 1, wherein a second threshold rotational speed above said threshold rotational speed is selected in such a way that a time period passes between reaching said second threshold rotational speed and reaching said threshold rotational speed, which permits said preparation of said switching over to said position controller, continuous in regard to said position or said rotational speed, from rotational speed regulation to position regulation.

Claim 10 (Currently Amended). The method for spindle orientation in accordance with claim 1, wherein [said second phase] nominal position values of said spindle for said second phase of orientation are preset in said position controller in such a way that a jerk-limited approach to said predetermined position of rest is caused.

Art Unit: 3722

Claim 12 (Currently Amended). A method for the orientation of a spindle of a numerically controlled and rapidly rotating spindle by which said spindle is brought from an initial rotational speed into a predetermined position of rest, the method comprising:

performing a first phase of orientation of said spindle by braking said spindle at a first braking rate function to a threshold rotational speed, wherein during said braking a switching over from a speed controller to a position controller is prepared, said switching over is performed at a switching time during a transition from said first phase of orientation to a second phase of orientation, said switching over is continuous in regard to position and/or rotational speed, and wherein a rotational speed of said spindle drops strictly monotonically during said switching over;

and performing said second phase of orientation of said spindle so that a predetermined position of rest for said spindle is controlled by said position controller from said switching time until said predetermined position of rest of said spindle has been reached in said second phase at a position time, said second phase of orientation having a second braking rate function different than said first braking rate function~~[- wherein a second threshold rotational speed above said threshold rotational speed is selected in such a way that a time period passes between reaching said second threshold rotational speed and reaching said threshold rotational speed, which permits preparation of said switching over to said position controller, continuous in regard to said position or said rotational speed, from rotational speed regulation to position regulation];~~

wherein a second threshold rotational speed above said threshold rotational speed is selected in such a way that a time period passes between reaching said second threshold rotational speed and reaching said threshold rotational speed, which permits said preparation of

Art Unit: 3722

said switching over to said position controller, continuous in regard to said position or said rotational speed, from rotational speed regulation to position regulation; and

wherein said method is only applied [if] when said initial rotational speed lies above said second threshold rotational speed.

Claim 13 (Currently Amended). The method for spindle orientation in accordance with claim [10] 12, wherein within said time period at least two actual position values and/or rotational speed values are determined, which permit an extrapolation of the position and/or rotational speed of said spindle at said switching time from rotational speed regulation to position regulation.

2. The following is an examiner's statement of reasons for allowance: EP 560 866 ('hereinafter '866) is considered to be representative of the closest prior art of record to the present invention as set forth in the independent claims 1 and 12.

It is noted that '866 teaches braking a rapidly rotating spindle from a first speed, such as N1 at time of $T = 0$ (see Figure 4), to a position of rest wherein the spindle speed is 0 at a time T1 (see Figure 4). Note that braking is applied such that a deceleration of the spindle speed occurs, as shown by the linear deceleration line L in Figure 4. During the deceleration or braking, a "switching over" to a position controller is prepared, noting that claim 1 of '866 explicitly teaches that operation control of the motor is switched from a speed control to a position control prior to the stopping. Whatever speed that inherently must exist, wherein prior to the spindle being decelerated to such speed, the aforementioned "switching over" is prepared, is considered the claimed "threshold rotational speed". Note that as shown in Figure 4, the rotational speed of the spindle "drops strictly monotonically". Once the described "switching

Art Unit: 3722

over” occurs, the time between the switching over time and the stopping point of the spindle is considered to be the “second phase of orientation” claimed.

However, it is noted that the entire deceleration of the spindle from the initial rotational speed to the rest position is represented by the linear deceleration function L (see Figure 4). Thus, ‘866 does not teach that a first phase of orientation of the spindle is performed by “braking said spindle at a first braking rate function to a threshold rotational speed”, and that a second phase of orientation (as defined in the claim) has a “second braking rate function different than said first braking rate function” as set forth in independent claims 1 and 12, shown in Figure 2 (noting the different braking rate functions illustrated in the graph in phases P1 and P2, for example).

Additionally, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to so modify the teachings of ‘866, and thus, ‘866 does not render obvious the present invention as set forth in independent claims 1 and 12.

‘866 being representative of the closest prior art of record to the present invention as set forth in the independent claims 1 and 12, for at least the foregoing reasoning, the prior art of record neither anticipates nor renders obvious the present invention as set forth in independent claims 1 and 12.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

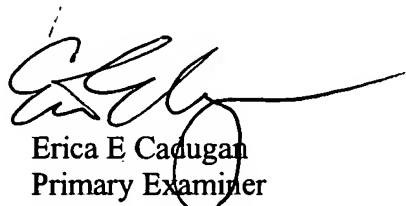
Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E. Cadugan whose telephone number is (571) 272-4474. The examiner can normally be reached on M-F, 6:30 a.m. to 4:00 p.m., alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer D. Ashley can be reached on (571) 272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erica E. Cadugan
Primary Examiner
Art Unit 3722